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9 May 1967

ORD-2763-67

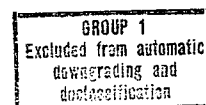
MEMORANDUM FOR THE RECORD

SUBJECT: Visit to Dalmo Victor to Monitor Modifications
of the CHIGOE LLLTV System

1. On April 17-18, 1967 the undersigned visited the D-V facility in Belmont, California to inspect the installation of an S-20 extended red response image intensifier in the Low Light Level TV camera head. The new intensifier tube showed improved contrast performance at very low light levels (10⁻⁷ ft. candle photocathode illumination) and at least 350 TV lines were resolved at that level in Optoliner tests.

2. LTV shipped the entire camera system to DV including monitors and cables but excluding platform and bulkhead connectors. DV noticed that the camera's automatic iris was jammed in a half closed position. This could explain Lt. Cmdr. Porter's dissatisfaction with the camera's performance during flight tests in November. The iris gear train was freed up and realigned. While the camera head was being modified, both monitors were checked and tuned up. The vertical roll over problem during warm-up in the operators monitor was eliminated. The cable connectors on the pilots monitor were checked for poor connections since during previous tests on the aircraft the reticle on the pilots display was intermittent. All connections checked out OK and intermittency appears to have cleared up. A new cable (3'-2" longer) was made connecting the pilots joystick to the servo electronics box. This was done at our request to permit moving the joystick to a location accessible to both pilot and co-pilot.

3. One system problem remains and should be fixed by DV with the system installed in the aircraft. The platform gimbals occasionally do not uncage, i.e., power transients apparently cause az/el servo systems to drive the gimbal cage pins hard against the sides of their holes so that the solenoids cannot extract them.

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As a result fuses blow. The undersigned discussed the problem with Bill Mallet, DV's platform expert. He agreed it would be possible to install a delay relay in the servo electronics box that would momentarily connect a dummy load to the servo amplifiers to establish proper voltage levels, then connect the az/el motors. I suggested that Jim Smith, Mgr. Electro-optics, contact [redacted] to establish a time and place for installing the platform caging fix and for participation in final acceptance flight tests.

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4. The Machlett intensifier installed in our camera has particularly good red and near-IR response as well as high luminous sensitivity. A copy of the tube spectral response is being forwarded for our evaluation. The process of changing image intensifier tubes is possible under field conditions but ill-advised. Approximately a 25% reduction in resolution can be expected if a reassembled tube assembly is not placed in a vacuum bell jar to improve optical contacting. DV has found that "3 in 1" oil serves well as an immersion fluid for optical contacting the intensifier to the SEC Vidicon but must be applied in a very thin uniform film. The leads from the SEC tube's grid and target must be shorted together when they are disconnected during the tube change procedure to prevent static charge build-up and resultant target destruction.

5. Mark Broemmelsiek, the project engineer, noted that Westinghouse SEC vidicons have improved starting with production units delivered in December 1966. They perform better generally, are not laggy at low light levels, can be operated at higher target voltages, and therefore exhibit higher gain. Smith and Broemmelsiek suggest our procuring a spare tube assembly. It would be costly (\$20K) but could be installed in the field and would improve camera performance. Not enough life data has been accumulated on SEC vidicons, but 50-100 hrs. is expected to be typical. A spare tube assembly may be necessary if extended use in the field is contemplated.

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